

October 18, 1994

Mr. Neil Thompson  
U.S. Environmental Protection Agency  
1200 Sixth Avenue  
Seattle, Washington 98101

Re: Colbert Landfill Document Review (Work Assignment No. 20-05-0P01)

Dear Mr. Thompson:

Ecology and Environment, Inc. (E & E), has completed its review of the Interim Draft Operation and Maintenance Manual, sections 7 and 8 and Appendix E (August 10, 1994) prepared by Landau Associates, Inc. (Landau). In developing review comments, references were made to the following documents:

- Final Extraction Well Plan, Phase II Remedial Design/Remedial Actions, Colbert Landfill, Spokane, Washington (August 7, 1992); and
- Technical Memorandum, Modifications to the Phase II Groundwater Interception/Extraction Systems, Colbert Landfill RD/RA Project (October 11, 1993).

The document review focused on those technical issues that have the potential to significantly impact the success of the proposed groundwater interception/extraction system and assessed whether the activities described in the reports are technically sound and likely to achieve the objectives identified in the reports. Mike Kuntz of the Washington Department of Ecology was contacted during the review and his concerns were considered and addressed. The review findings are presented in the attached comments. The review did not include an examination of the accuracy of the information presented in the reports.

If you have any questions, please contact me at (206) 624-9537.

Sincerely,

Lyle Diediker  
Project Manager

Attachments

cc: T. Langton; EPA, Region 10  
J. Villnow; E & E-Seattle  
D. Shivjiani; E & E-Seattle

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## DOCUMENT REVIEW

### FINAL EXTRACTION WELL PLAN, PHASE II REMEDIAL DESIGN/REMEDIAL ACTION

<u>Item</u>	<u>Page/Section</u>	<u>Comment</u>
1	p. B-5, Section 4.0, Paragraph 1; p. B-14	The upper and lower aquifers are interconnected (as evidenced by site contaminant migration and the geological cross-section; p. B-14) and should be modeled together, not as two separate entities. While addressing both aquifers in one model is more complex, it would more accurately represent the physical conditions of the site.
2	p. B-5, Section 4.1; p. B-14 to B-18	The model domain does not adequately represent site conditions, given that it does not include the entire site (p. B-17 and B-18). The domain should extend a sufficient distance to the east to minimize the boundary effects of the model on the area of interest. The geological cross-section (p. B-14) illustrates the Lacustrine Unit extending east of the limit shown on Figure B-2 (p. B-15) and the model domain (p. B-17). The cross-section illustrates the Lower Sand/Gravel Unit extending east of the site and the Lacustrine Unit boundary; however, Figure B-3 (p. B-16) and the model domain (p. B-18) illustrate the unit ending beneath the site and west of the Lacustrine Unit limit.
3.	p. B-6, Section 4.2.1, Paragraph 1; p. B-19	A rationale should be provided for only modeling the Lacustrine Unit pinch-out due east of the site and not along a wide north-south band east of the site (p. B-19).
4.	p. B-7, Section 4.3.2, Paragraph 2	The model assumes that the Lacustrine Unit extends beneath the river rather than the river having eroded the unit and the Fluvial Unit being in direct contact with the Lower Sand/Gravel Unit. This assumption is not sufficiently conservative; additional supporting data are needed.
5.	p. B-10, Section 5.4, Paragraph 3	Model verification should be re-examined when the Phase II data become available.
6.	p. B-8 and B-9, Section 5.2; p. B-15, B-16, B-24, and B-25	The model needs to be recalibrated to more accurately reflect the measured data. Comparisons of measure versus simulated head contour lines for each aquifer should be presented on a single figure for comparison. For example, examine the orientation of the 1,772-foot contour line on figures B-2 and B-11 (p. B-15 and B-24, respectively).
7.	p. C-2, Paragraph 2	Inaccuracies resulting from the hydraulic model are incorporated into the input data for the solute transport model.

## DOCUMENT REVIEW (Cont.)

<u>Item</u>	<u>Page/Section</u>	<u>Comment</u>
8.	p. C-2, Paragraph 3	Dispersion should be accounted for in the solute transport model. The maximum concentration information needed for the treatment system can be obtained from analytical data and does not require modeling. The model needs to address at least transverse dispersion to identify the width of the contaminant plume for determining extraction well locations.
9.	p. C-6 and C-7	Figures C-2 and C-3 (p. C-6 and C-7, respectively) present simulated contaminant plume information for areas east of the landfill that are outside the model domain for the flow modeling (p. B-17 and B-18). Hydraulic information used as input data for the solute transport model simulation east of the landfill should be discussed.

## DOCUMENT REVIEW (Cont.)

### TECHNICAL MEMORANDUM

<u>Item</u>	<u>Page/Section</u>	<u>Comment</u>
1.	p. 6, Section 4.1, Paragraph 2	The rationale for eliminating planned monitoring well CP-S2 and converting planned extraction well CP-S3 to a monitoring well appears sound. As stated in the last sentence of the paragraph, this issue may have to be re-evaluated based on future analytical data from well CP-S3.
2.	p. 7, Section 4.2.1, Paragraph 3; Figure 8	The rationale for not constructing extraction well CP-E4 is not convincing. If the well is not needed (i.e., a change in pumping regime will suffice), why was it proposed initially? Relocation of the well to an area along the perimeter of the compost facility appears practical, especially since the city/county may have been partially responsible for contaminant deposition in the landfill. Figure 8 depicts areas beneath the compost facility with sufficient saturated thicknesses to support an extraction well.
3.	p. 8, Section 4.2.2., paragraphs 1 and 2	The rationale for not constructing extraction well CP-W4 is not convincing for the same reasons presented in Comment 11. Since both CP-E4 and CP-W4 are Lower Sand/Gravel Unit extraction wells, can one extraction well be constructed on the compost facility property instead of two?
4.	Figures 9, 10, 11, and 12	An explanation is needed for the capture zone boundary illustrated on each figure. The revised capture zone on the west side of the site for each figure does not incorporate the particles migrating from the site to the river.

## DOCUMENT REVIEW (Cont.)

### INTERIM DRAFT, OPERATION AND MAINTENANCE MANUAL

<u>Item</u>	<u>Page/Section</u>	<u>Comment</u>
1.	p. 7-3, Section 7.2, Paragraph 1	The source control extraction wells are extracting from the Lower Sand/Gravel Unit. Since site contaminants must be migrating through the Upper Sand/Gravel Unit to reach the lower unit, source control extraction wells should be placed in the upper unit.
2.	p. 7-10, Section 7.5; figures 7-3, 7-5, and 7-8	A rationale explaining the selection criteria for the Upper Sand/Gravel Unit monitoring wells is needed in this section. The locations of the wells do not appear to adequately monitor contaminant migration in the upper unit. Figure 7-5 illustrates the well locations. No wells are monitoring potential contaminant migration to the southwest, west of U.S. Highway 2 (see Figure 7-3). Private wells are generally not sufficient due to limited access and incomplete/inadequate well construction information and standards. The wells located near the extraction wells (see Figure 7-3) are all within the cone of depression depicted on Figure 7-8 and cannot monitor site contaminants that may be migrating past the capture zone on the east or west sides of the cone.
3.	Section 8, Appendix E	Section 8 and Appendix E should be approved as written.